File AFE 715-531-C37 CEM

WALKER ENGINEERING

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June 7, 1976

Mr. Dick Fleming
Beker Industries Corporation
P.O. Box 37
Conda, Idaho 83230

Dear Dick:

Enclosed herein is the narrative relating to the A.F.E. drainage study undertaken at your request. This work was accomplished under your purchase order number 09174.

We sincerely hope this information and format will be sufficient, and will augment your presentation to headquarters.

Thank you for considering us for this study. If we can be of any further assistance, please let us know.

Very truly yours,

WALKER ENGINEERING

Kenneth S. Wood
for
Leslie M. Walker P.E.

LMW:rb

Enc.

FH0031576

DRAINAGE STUDY

An investigation of a comprehensive drainage plan for the Beker Industries' Conda plant was studied under purchase order number 09174. This study was at the request of Mr. Dick Fleming. On April 28, 1976, a meeting was held during which the general scope of the A.F.E. was defined and discussed at length. A second meeting with the Beker project engineer, Conrad Michaelson, was held in May. In this meeting Mr. Michaelson reviewed the preliminary study. The results of this meeting have been incorporated into this report.

The generalized drainage plan for the Conda plant was evaluated on the basis of completing most urgent items first. Necessarily, these priority items must be fully compatible with future drainage plans and plant expansions.

The south end of the plant, or the chemical plant area, has similarities in drainage requirements, effluents from processes, and contributing drainage basins. The north end, or the old Mountain Fuel plant, is an entirely separate problem. This area does not have the acid concentrations produced in the chemical plants. The contributing drainage basins are separate and distinct, or unique to the north end. Therefore, the north end was not treated in this study and may be the subject of future investigations.

The scope of the study involving the south end of the plant was further divided into two distinct phases. The first phase is the subject of this report, while the second stage has been considered for future work. The areas covered by phase one in this report are outlined on the drawings in the appendix. The phase one items are considered to be the priority items. Those of phase two are general and cover all other work in the chemical plant area. Much of phase two will consist of site grading, asphalting of parking areas, and earth ditch construction. The work to be performed under this A.F.E. is estimated to cost $394,099.42. A breakdown of these costs may be found in the appendix. This cost includes engineering, surveying, field supervision, and contingency. The prices are based on local estimates from contractors, suppliers, and our experience in the field of construction. They are also based on a competitive bid contract, executed by experienced construction engineers. This price will obviously not hold on a time and material basis.

The necessity for this work was generated by and from several different sources, not the least of which is the environmental considerations expressed by the E.P.A. A second consideration is employee safety. By containing acid spills, and normal contaminated process discharges, and properly disposing of them, the employee exposure to these effluents will be greatly lessened. A major consideration in providing adequate and planned surface drainage is the preservation of the underground electrical distribution system. This system is comprised of an underground network of cables which distribute power to all

the chemical plant areas at a voltage of 13,800 volts. The importance of keeping the surface water and process acids from reaching the cable insulation is apparent. The access manholes to the underground distribution system are, in most cases, below grade and tend to act as a natural sump to these process effluents. The necessary solution to this problem has been incorporated into this A.F.E. study.

In the ammonia area, and around well number 6, the overflow of the ammonia sump may leach through the well casing directly into the well number 6 influent. It is our understanding that the individual water bearing stratums of several of the potable water wells were not sealed during the well drilling operations. Although this is not a part of this study, it should be further investigated as a possible method of improving the water quality by preventing drainage of contaminated water down the outside of the well casings.

Much of the surface runoff which may occur during times of heavy rainfall or snow melt will be uncontaminated water. This runoff should not flow into the ditches reserved for chemical plant discharges. The cost of pumping the uncontaminated runoff to the ponds, and pond storage area required, may be eliminated by strategically locating a few key earth ditches and culverts. This diversion of clear runoff will substantially reduce the pumping requirements of the sump. This clear runoff could be directed outside the plant area into existing county roadway barrow ditches. Under normal conditions this discharge should not be of a quantity which will adversely affect other properties downstream.

The individual items considered necessary immediately and as priorty items in this study are as outlined in the following paragraphs.

1. SITE GRADING This grading is, of course, the first and singularly most important item. The terrain and geography of the areas in and around the buildings must drain to common collecting areas and ditches. This will require, in almost all areas, the lowering of the existing grades to facilitate drainage away from buildings. This general grading should, with normal care, be easily maintained in the future.

2. WASTE MATERIAL The general site grading above will generate an excess of earth. This earth is slated to be hauled and wasted in the area between the cooling water pond and the number 2 gypsum pond.

3. CULVERT RELOCATIONS In an effort to curtail unnecessary expenditures, existing culverts will be salvaged and relaid to new grades where feasible.

4. NEW CULVERTS New culverts included are generally asbestos cement pipe. The majority of these culverts are 12 inches in diameter and are expected to be covered with a minimum of one foot of cover when under roadways. The largest new culvert planned is 24 inches in diameter.

5. CONCRETE CURBS These curbs are to be located around hydrant, valve, and electrical manhole locations.

6. HEADGATE STRUCTURES One structure with sliding gate is to be located at the road intersection by the mobile shop to divert large uncontaminated flows immediately out of the plant area. The other two gate structures are located on the intake end of the 24 inch diameter pipes under the west railroad tracks.

7. ELECTRICAL TO SUMP PUMP This item includes the necessary trenching, conduit, wiring, and circuit devices required to operate the second sump pump.

8. PUMPS 750 gpm Two 750 gallon per minute pumps are included. These pumps are designed specifically for this application, and will function with a minimum amount of maintenance. Pumps in this service should be direct drive for minimum care. These pumps are Gould vertical stainless steel pumps. The selection of the proper pumps is imperative, as the entire drainage scheme is based on pumping the acid from a common collecting point.

9. EARTH DITCHES These ditches will carry uncontaminated surface runoff. They will be trapezoidal in shape and of minimal depths. A 1200 foot section of this item is located just east of the contractor's entrance road. It is anticipated that this ditch will collect the natural drainage occurring above the plant area, and divert it safely away from the plant buildings. The discharge of this runoff to the county barrow ditch is an item which, in the final design, must be in cooperation with county standards and regulations.

10. SUMP IMPROVEMENTS These improvements are limited to two each incoming pipes to the sump and provisions for containing overflows. Also, the transition from a concrete-lined ditch to sump intake pipes is included.

11. R.O.P. WEST DITCH This ditch is estimated on the basis of being about 12 inches in depth and being concrete lined. It is the ditch on the west side of the R.O.P. building.

12. CONCRETE-LINED DITCHES These ditches are slip formed concrete ditches. They will be lined with an epoxy coating to make them suitable for acid service.

13. ROAD ASPHALTING The road costs include sub-base compaction, crushed road gravel spread to grade, and a 2 inch thick 24 foot asphalt surface.

14. ASPHALTING AROUND BUILDINGS This item includes the area along the east side of the R.O.P. building and in and around the D.A.P. and T.S.P. areas. The heavy traffic in these areas and maintenance of proper grades should become condiserably easier by this treatment.

The engineering costs are inclusive of the following services: all surveying, design, specifications and contract documents, bidding, field supervision, and the necessary coordination with Mr. Michaelson, the project engineer for Beker Industries.

The total estimate of $394,099.42 is based on a competitive bid situation at current prices. It is our opinion that this price may be held as valid if the work and scope of work are accomplished in the very near future.

A.F.E. ESTIMATE - JUNE 7, 1976

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
1.	Site Grading Around Buildings	CY	61,100	$ .48	$29,328.00
2.	Waste Material From Site Grading Hauled to Pond Area	CY	6,280	1.30	8,164.00
3.	Culvert Relocation (Existing Culverts)	LF	160	9.00	1,440.00
4.	New Culverts	LF	830	12.60	10,458.00
5.	Concrete Curbs Around Manholes	EA.	40	90.00	3,600.00
6.	Headgate Structures	EA.	3	2,500.00	7,500.00
7.	Electrical to Sump Pumps	EA.	1	3,500.00	3,500.00
8.	Pumps, 750 gpm	EA.	2	12,480.00	24,960.00
9.	Earth Ditches	LF	7,200	3.00	21,600.00
10.	Sump Improvements	EA.	1	7,800.00	7,800.00
11.	ROP West Ditch	LF	1,200	3.30	3,960.00
12.	Concrete Lined Ditch	LF	4,600	25.30	116,380.00
13.	Road Asphalting	LF	4,440	14.50	64,380.00
14.	Asphalting Around Building	SY	5,520	4.10	22,632.00
	SUB-TOTAL				$325,702.00
	ENGINEERING (10%)				32,570.20
					358,272.20
	CONTINGENCY (10%)				35,827.22
	TOTAL				$394,099.42

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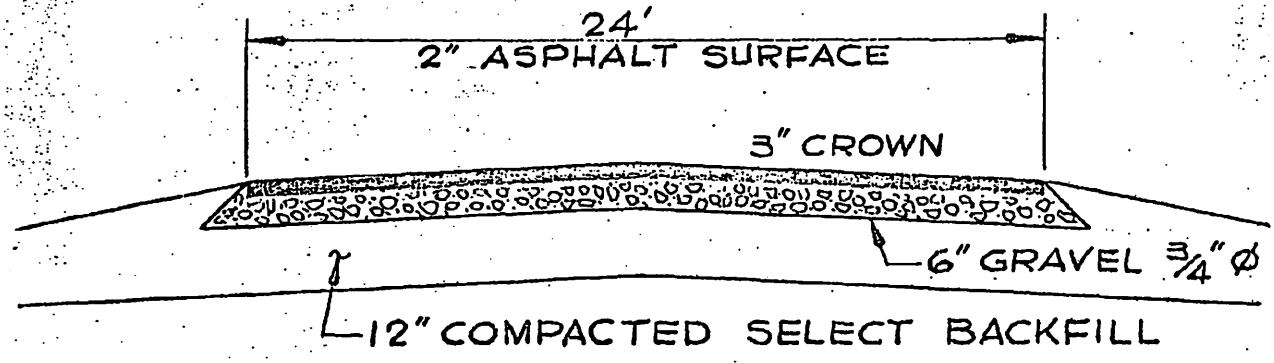
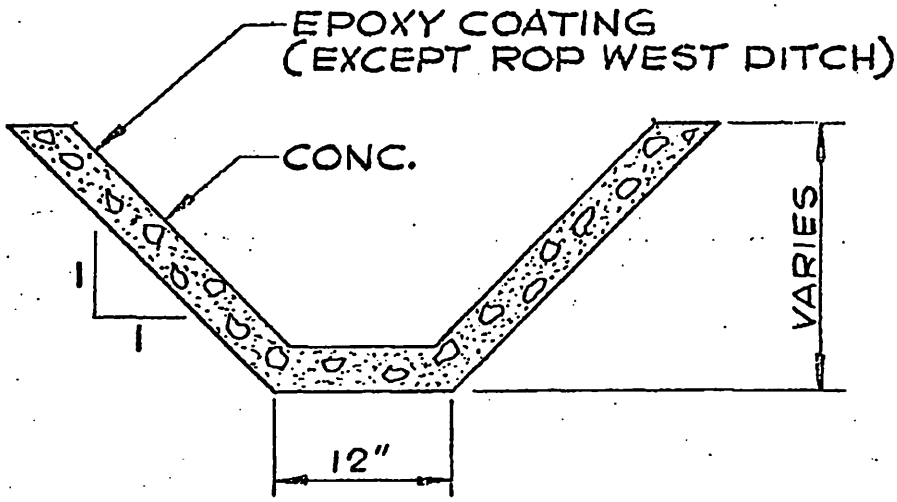
TYP. ASPHALT ROAD SECTION



TYP. CONCRETE LINED DITCH



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